

Remarks

The Office action mailed November 24, 2006, has been reviewed and carefully considered. Reconsideration and withdrawal of the pending rejections is respectfully requested for the reasons discussed below. New claims 36-38 have been added. Support for new claim 36 is found in the specification, for example, at page 4, lines 4-5. Support for new claims 37 and 38 is found in the specification, for example, at page 10, lines 16-17. Entry of the new claims is respectfully requested.

35 U.S.C. §112, First Paragraph, Rejection

Claims 7-12 and 33-35 have been rejected under 35 U.S.C. §112, first paragraph, because the application allegedly does not provide written description for the claim phrase “wherein the composition does not include a phenol-formaldehyde resin or a urea-formaldehyde resin.” The Office action on page 3 simply states that “[t]he concept of excluding a phenol-formaldehyde resin or a urea-formaldehyde resin is not disclosed in the Specification.” However, as explained in the Remarks section accompanying September 5, 2006, Reply and Amendment Accompanying RCE, such concept is indeed disclosed in the application.

Applicants note that there is no *in haec verba* requirement for newly added claim limitations; *express, implicit* or inherent disclosure is sufficient. The PTO has the burden of “presenting evidence or reasons why persons skilled in that art would not recognize in the disclosure a description of the invention defined by the claims.” MPEP §2163, p. 2100-169. Thus, when applicants present arguments traversing a written description rejection, the PTO must consider those arguments and present evidence or reasons for maintaining the written description rejection beyond simply stating that the subject matter at issue is “not disclosed.” See MPEP §2163.04(II), p. 2100-181.

When viewed in *context of the whole application*, support for the exclusion of phenol-formaldehyde resin or a urea-formaldehyde resin in claims 7-12 and 33-35 is readily apparent. Claim 7 is directed to “a substantially formaldehyde-free adhesive.” As explained on page 11, lines 16-22, of the specification, substantially formaldehyde-free compositions do not include

formaldehyde or “any compounds that may degenerate to form formaldehyde.” As explained on page 1, line 28 page 2, line 17, of the specification, phenol-formaldehyde and urea-formaldehyde wood adhesives both release formaldehyde during their manufacture and their use in wood composites.

“Currently, most wood composites use a phenol-formaldehyde (PF) or urea-formaldehyde (UF) wood adhesive. These adhesive materials suffer from two major drawbacks. First, both adhesives release volatile organic compounds (VOC) during their manufacture and during their use. Released VOC include chemicals that are thought to be hazardous to human health, such as formaldehyde, which is a suspected carcinogen. Increasing concern about the effect of emissive VOC, particularly formaldehyde, on human health has prompted the development of more benign adhesives. The emission of VOC, including formaldehyde, from wood composites has been studied extensively. See, for example, Baumann et al., “Aldehyde Emission from Particleboard and Medium Density Fiberboard Products,” *For. Prod. J.* 50:75-82, 2000; Henderson, J.T., “Volatile Emissions from the Curing of Phenolic Resins,” *Tappi J.*, 62:9396, 1979; Lambuth, A.L., “Adhesives from Renewable Resources: Historical Perspective and Wood Industry Needs,” *Adhesives from Renewable Resources*; Hemingway, R.W. Conner, A.H. Branham, S.J., Eds.; American Chemical Society: Washington, DC, pp 5, 6, 1989.”

The above quoted passage from the specification also discusses the problems associated with the current use of phenol-formaldehyde and urea-formaldehyde wood adhesives. The quoted passage emphasizes that formaldehyde is released from phenol-formaldehyde and urea-formaldehyde wood adhesives. The Background section of the specification concludes by stating that “the wood composites industry would benefit greatly from the development of formaldehyde-free adhesives produced from renewable resources.”

The lack of a phenol-formaldehyde or urea-formaldehyde resin in the compositions of claims 7 and 33-35 is further emphasized by the specification at page 11, lines 14-22. For instance, page 11, lines 14-16 report that “[t]he novel adhesive compositions disclosed herein provide adhesive properties comparable or superior to commercial phenol-formaldehyde resins, *but do not require using formaldehyde*” (emphasis added). This sentence compares and contrasts the claimed adhesive with the conventional compositions that include formaldehyde-containing resins. A person of ordinary skill in the art reading the specification would clearly understand that such comparison and contrast means that phenol-formaldehyde or urea-formaldehyde resins are excluded from the compositions of claims 7 and 33-35.

Viewed as a whole, the application clearly sets the stage for an inventive adhesive composition that is substantially free of formaldehyde, and that the conventionally used phenol-formaldehyde and urea-formaldehyde resins are specifically targeted for exclusion from the inventive adhesive compositions.¹ Thus, a skilled artisan would “reasonably conclude that the inventor had possession” of an adhesive composition that does not include a phenol-formaldehyde or urea-formaldehyde resin. See MPEP §2163, p. 2100-165.

35 U.S.C. §103 Rejection

Claims 1-3, 5-12, 19-31 and 33-35 have been rejected under 35 U.S.C. §103 over Lehtinen et al. or Lloyd et al. in view of Brode, III et al. or Blount taken with Falkehag. The examiner states asserts that each of Lehtinen et al. and Lloyd et al. disclose a composite that includes a lignin component, an amine compound, and a boron compound. Brode, III et al. and Blount are relied upon for disclosing compositions that include decayed or degraded lignins, making the inclusion of decayed or degraded lignins in the Lehtinen et al. or Lloyd et al. composites an allegedly obvious modification. Falkehag is relied upon for using a demethylated lignin in a composition that includes polyamine. However, the purported combinations of references would not have resulted in the presently claimed inventions even assuming *arguendo* that there would have been motivation to make the combinations.

The examiner asserts that a “melamine” disclosed in each of Lehtinen et al. and Lloyd et al. is an amine compound as recited in the presently pending claims. The “melamine” in each of Lehtinen et al. and Lloyd et al. is a melamine-urea-formaldehyde resin (see Lehtinen et al., column 3, lines 18-20; Lloyd et al, column 3, lines 12-14). There is no suggestion in either Lehtinen et al. or Lloyd et al. to use melamine alone. Viewing the claims as a whole, the claimed adhesive composition is “substantially formaldehyde-free.” A composition that includes a melamine-urea-formaldehyde resin as disclosed in Lehtinen et al. or Lloyd et al. would not be

¹ See *In re Wright*, 9 USPQ2d 1649, 1651 (Fed. Cir. 1989) in which claim language was found to satisfy the written description requirement where “it is of the essence of the original disclosure that the microcapsules are ‘not permanently fixed’ to their various supports.”

“substantially formaldehyde-free.” For this reason alone, the combination of the asserted references would not have resulted in the presently claimed adhesive compositions.

Furthermore, neither Lehtinen et al. nor Lloyd et al. disclose a composition that includes a “lignin component” as recited in claim 1. As described on page 4, lines 11-15, “the lignin component can be derived from renewable resources, particularly lignocellulosic materials, and can include one or more materials such as decayed wood, solubilized decayed wood, analytical lignin preparations, industrial lignin preparations, and the like.” Thus, a lignin component is not simply a lignocellulosic material, but instead can be derived from lignocellulosic materials.

Neither Lehtinen et al. nor Lloyd et al. make any mention of “lignin.” The lignocellulosic materials described in the primary references for use in making the composites are not, by themselves (i.e., in a chemically-unaltered state), a lignin component. For example, none of the lignocellulosic materials disclosed in the primary references, are decayed wood, solubilized decayed wood, analytical lignin preparations, or industrial lignin preparations. Rather, the lignocellulosic materials in the primary references are simply wood particles or wood fibers (Lehtinen et al., column 2, lines 22-23; Lloyd et al., column 2, lines 47-61).

More specifically, examples of analytical lignin preparations (Brauns lignin, cellulolytic enzyme lignin, dioxane acidolysis lignin, milled wood lignin, Klason lignin, and periodate lignin) and industrial lignin preparations (kraft lignin, lignosulfonates, and demethylated lignin) are set forth in the present application at page 4, lines 6-10). Neither one of the primary references mention any of these lignin preparations.

The examiner cites to two secondary references (Brode, III et al. and Blount) for disclosing compositions that include decayed or degraded wood.

Brode, III et al. discloses a bait matrix in which “decayed wood” is listed as a possible ingredient out of many other possible ingredients (column 16, lines 8-10). There would have been no motivation or reasonable expectation that a speculative component of a bait matrix composition would be useful in an adhesive composition. The important characteristics of a bait matrix have no relationship to the important characteristics of an adhesive composition or a wood composite meaning that there would have been no connection between Brode, III et al. and the primary references.

Blount et al. describes a process for making a lignin-cellulose silicate polymer that utilizes a “broken-down alkali metal plant polymer.” There would have been no motivation or

reasonable expectation that a component of for making a silicate polymer would be useful in an adhesive composition. The important characteristics of such a polymer bear no relationship to the important characteristics of an adhesive composition or a wood composition meaning that there would have been no connection between Blount et al. and the primary references.

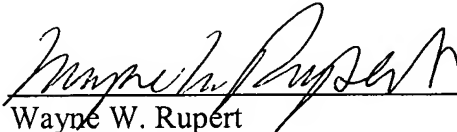
Independent claim 29 is directed to a composition that includes demethylated lignin as an ingredient. As discussed above, neither Lehtinen et al. nor Lloyd et al. disclose a lignin, much less a specific class of lignins, namely *demethylated* lignin. Falkehag discloses hexamethylene tetramine derivatives of alkali lignins. There would have been no motivation or reasonable expectation that such derivatives would be useful in adhesive composition as presently claimed.

It is respectfully submitted that the present application is in condition for allowance. Should there be any questions regarding this application, examiner Nutter is invited to contact the undersigned attorney at the telephone number shown below.

Respectfully submitted,

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